Analyzing and Evaluating the Information Technology System in PT. Repex Perdana International's Logistic Activities

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Abstract - Innovations are one of the most important jobs that are conducted by almost all organizations, business and firms in order to improve their current operation capabilities. In this research, the chosen company, Repex Perdana International (RPI) the license owner of FedEx International, innovate a new information technology into their system in order to improve their performance in the logistics. The goal of this research is to "analyzing and evaluating the recent implementation of Information Technology (IT) system in RPI, specify in its effectiveness and efficiency". The purpose of analyzing the IT system is to see what kind of improvement that achieved so far and at the end devise a possible recommendation and suggestion to improve it. As the research undertaken, some conclusions have been made on the basis of research findings which are showing positive results of the investment. However some drawbacks also founded from the system and in the end there will be recommendations to counter these drawbacks, future improvement, as well as future research.

Keyword – Logistics, IT / Information Technology, Management, Logistics Activities, Investment, Supply Chain

1. Introduction

How well the company conduct planning, controlling, and managing logistic activities within their system will influence the delivery of product or service to the customer. Logistic can be defined as distributing products and services from source of supply through the place of manufacture to the point of consumption in a cost-effective way whilst providing an acceptable service to the customer (Rushton, 2010).

The chosen firm of this research is PT. Repex Perdana International, part of RPX holding group, a third party logistics company who own the exclusive license of FedEx international for Indonesian market. The company handles the FedEx international package that are destined to or shipped from Indonesia. This research is based on the analyzing and observing of RPI in Surabaya branch office.

Following the coming of 21st Century, the historian and the scholars are identifying the era as what they call the information or digital age. In information age the easier way of connectivity and communication between firms drive a new form of

relationships called supply chain management. Supply chain management can be described as multiple firms collaborating to leverage strategic positioning and to improve operating efficiency (Bowersox, 2013). As the time flow, even the current supply chain management has facing a certain changing as to adapt with the current environment and technology model resulting in Supply chain revolution (Bowersox, 2013).

According to Andry Adiwinarso, Vice President Sales & Marketing RPX group (www.tempo.co.id, access at 10th january 2013), RPX company is going to invest 50 million USD or 458,5 billion Rupiah (around €36,68 million, assuming the rate of 12.500) to improve their Information Technology (IT) system. The implementation of new IT system will help the company to control the goods movement to be more accurate, allowing the company to deliver package more effective & efficient also better delivery time forecast. With a better control of delivery time the companies could guarantee refund any late delivery even only for 1 minute late. This plan will be a major long term investment that will be last for 5 years, started from 2010 till 2015.

Follow up to the investment that being run by RPX group stated above, since then, the IT investment have been progressed for 1 year. The objective of this plan is to improve the overall company's logistic capabilities by make better use of IT system as well as deliver it to customer. There are some short term, midterm, and long term goals that are going to be achieved by RPX in 5 years investment. For short term, the company expects that at least all employees familiar with the new system and knows how to operate it in order to improve overall logistic capabilities; for midterm, the company expect that most customer also aware about the new IT system and make a good use of it; and in the long term, the company expect that other parties (such as custom duty) also integrated with the system allowing future automation, scheduling, arrangement for shipment and faster & effective delivery. The company plan don't share the payback period financially however they do share the payback period for its affect in the logistic operation.

This research will look deeper to find out the company progress in their investment and ultimately come up with recommendations plan that might be improve their progress for IT implementation. To define it clearly, the problem that will be researched in this study is: "Analyzing and evaluating the result of IT investment on RPI logistics activities specify in its effectiveness and efficiency"

1.1.Initial Research Analysis

The fishbone diagram will be used as a tool for this analysis, because its help the researcher to explain a cause and effect in more systematic ways. (Ishikawa, 1990). In the Fishbone diagram below, it shows the reasons and the points needed to be researched further in order to get the answer of before and after implementation the IT system in RPI's logistic activities.
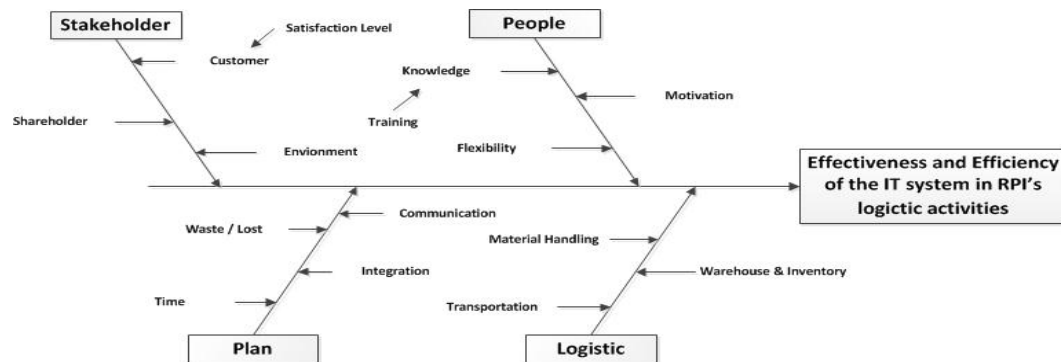

Figure 1: Fishbone Diagram (Researcher)

After conducting a quick analysis on fishbone diagram, 4 factors have been found out to be the main factor that will be researched further to answer the main research problem. Thus from these 4 factors, 4 main research questions are formulated as follows:

1. What kind of improvements and changes that occur at RPI's current logistics activities compared to before the IT system implemented?

2. What are the effects of new IT system to the employee's working performance in RPI's operation?

3. What kind of changes appeared in the RPI's planning after the investment of the IT system in their logistic activities?

4. What drives the difference in stakeholder's reaction after the IT system implemented?

2. Research Methods

This research is conducted based on several steps that will serve as the guideline for the researcher. The following figure describes some steps that will be taken to organize the research.
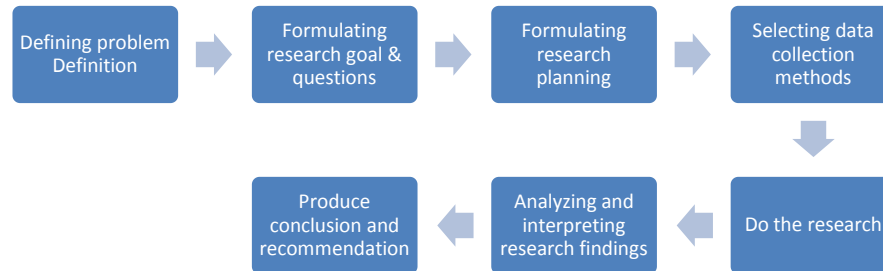

Figure 2: Research Steps (Researcher)

In this research, both descriptive studies and explanatory studies are used as the research nature. The descriptive studies is used from the use of gathered data from 4 aspects of RPI and constructed in the fishbone analysis; while the explanatory studies is appear when combining 4 variable aspects in the fishbone analysis to answer the research question thus ultimately will answer the research problem.

The goal of this research is to analyze and evaluate the investment of IT in RPI logistic activities specify in its effectiveness and efficiency; and the result of this result is a recommendation for further improvement that might be useful for the company therefore the approach of this research is an applied research. In applied research, at all time the result of the research should be possible to be applicable in real life. In this research, the researcher will use both primary and secondary data to solve the research problem. The explanation of its use will be explained in the later sub chapters.

2.1.Research Strategy

Research strategy is a general plan of how the researcher will go about answering the research questions. After determining the research goals and research questions, the next step is defining a strategy to answer the 4 research

A case study is explores a research topic or phenomenon within its context, or within a number of real-life contexts (Saunders, 2012). Case Study is chosen as the research strategy because, in this study, the researcher will analyze a single case of delivery in the RPI and will compare it to the company record of their past delivery before the IT system implemented.

In correlation with the case study research strategy, the researcher further formulates the strategy to answer each research questions as follows:

- **What kind of improvements and changes that occur at RPI's current logistics activities compared to before the IT system implemented?**

  The improvements and changes in the logistic activities can be identified by look deeper into RPI current logistic activities compared with the data of their past performance. This could be from the interview from the operational employee or the delivery record of RPI.

- **What are the effects of new IT system to the employee's working performance in RPI's operation?**

  Similar to previous questions, the main sources to answer this research question is based on employees' interviewee as well as the record data. This interview will be based on employee's personal opinion on RPI new system.

- **What kind of changes appeared in the RPI's planning after the investment of the IT system in their logistic activities?**

  In analyzing this question, the interview will look deeper into the management area rather than the operational area. The manager staff will be chosen as the interviewee to gather the information.

- **What drives the difference in stakeholder's reaction after the IT system implemented?**

  To answer this question, the researcher will rely on using the company record and statistic database on stakeholder's reaction such as customer satisfaction data and employee's condition (e.g. salary). However in case the company didn't have the specific data needed then the researcher will rely on interview with key players of the company.

5

2.2. Theoretical Framework

The theoretical framework is a framework that's formed from the theory concept or idea. The purpose of this framework is to point out some different theories to answer the specific research questions and solve the research problem. For this research, at least the following theories might be used: basic concept of IT (EDI and other technology), logistics activities, Value-Added services, performance measurement, lead time, integration of logistics information system, and Gap analysis.

2.3. Research Instruments

➢ Interviews

The main personal interview will be conducted to the manager of the Repex Perdana International Surabaya branch. The interview method will be a focused interview so that the researcher can gain some opinion from the respond. Number of interviews will be depending on the sufficient Data needed, at least as follows:

- Investment goal/expectation   - The progress so far

- Detail in logistic activities   - Employee opinion on system

- Changes in planning   - Delivery example

- Effect to stakeholder (both to customer and shareholder)

Some informal unstructured interviews will be conducted to some of the field employees to understand more about the company condition.

➢ Literature Reviews

The literature reviews will be mainly taken from frequent visits to library and gather the information from books and journal. A desktop research will be conducted as well to gather some theories and literature from online and web journal. All theories, works and literature will be cited in the bibliography.

➢ Observation

The observation will be taken in the company logistic activities. Some of the company's employees selected to be the Participants. This method of data collection is designed to gain the information based on the participant daily activities in their logistics, revealing the working performance in the company.

3. Research Findings

3.1. Research Question 1

Based on interview with Mr. Anang Riswanto, supervisor express of RPI Surabaya, and Mr. Tulus Priyanto, senior courier of RPI Surabaya, some main logistic activities that conducted by RPI are:

- **Order Processing**

After the IT installment, self pickup service delivery and the automation order processing is possible for RPI, causing the company to automatically process and relay the shared information gathered from the customer delivery order; thus saving time. There's lower time consumption for overall customer order processing from 15 to 30 minutes down to no more than 3-5 minutes. This improved lead time resulting in the reduced previous front desk and input entry employee from 3 staffs to just 1 staff after the IT implemented. (This finding was from Surabaya branch office observation)

- **Information Flow**

Flow of information is more flexible and more transparent. Today with just inputting the AWB number, tracking reference number, or scanning the code; the packages could be detected not only by the customer service but all employees and customer as well. After new system implemented, from the company record and interview show that the time needed for data searching is reduced from 5-10 minutes down to less than 1 minute.

- **Packaging**

The current packaging is crucial for the new IT system, as at this point the package get the barcode label which will share the information contained in the database for the whole logistic process. However there are not many changes in packaging effectiveness and efficiency.

- **Material Handling**

After new IT implementation, the human error and lead time for this activity is reduced dramatically. Human error from 5-10% reduced to 1% and the overall lead time is improved to less than 1 minutes. This is mainly because of the accuracy

information in digital form and the faster online information search compared to the manual information search.

- **Inventory Management**

Computerized warehouse activities supported by Wahana Online Warehouse System (WOWS) allow the company to easily manage the inventory transit, sorting, weighing, storing, etc. RPI also installed the adjustable racking storage system which helps the well organized movement and transit process.

With the new system the warehouse over limit rate caused by unorganized rack storage is reduced down to zero occurrences. Thanks to the automation system, the computer automatically changes the empty rack storage of certain destination for use of crowded destination packages storage. The time needed for planning and storing as well as searching the package within the inventory is reduced down to 1 minute.

- **Shipping**

The installed IT system helps the company to keep track of the packages on shipping process anywhere and anytime. The system also helps in planning to maximize the full container load (FCL) and minimize the less container load (LCL).

After the system implemented the improvement in FCL calculation is possible. This improvement is shown by the dramatic increase of FCL up to almost 80% of every shipment. (Company record for Surabaya and Taiwan delivery)

- **Custom Clearance**

The big improvement in custom clearance process after integrated IT system is faster information relay which reduce the clearance documentation process from hours and days to as fast as 2 hours or even less if the customer ready with their document.

- **Customer Service**

With the customer ability to track their own packages via e-mail, the customer service got less complain and less call as mentioned by Mrs. Diana, the senior customer services of RPI Surabaya, that the complain is reduced to only 1-2 out of 10 customer which mean the complain rate is down to 10-20%.

To sum up the finding in research question 1, there's no change in the activities type after the IT implementation because these activities are core logistic activities in RPI, however there's much improvement in logistic activities of RPI.

Table 1: Research Finding 1 – Logistics Activities (Researcher)

Logistics Activities (for 1 package job)	Before IT installment	After IT installment	Conclusion
Order Processing	Lead time: 15-30 minutes Staff Needed: 3	Lead time: 3-5 minutes Staff Needed: 1	More efficient
Information Flow	Lead time: 5-10 minutes	Lead time: 1 minutes	More efficient
Packaging	-	-	No big change
Material Handling	Human Error: 5-10% Lead Time: 7-10 minutes	Human Error: 1% Lead Time: 1 minutes	More effective and efficient
Inventory Management	Lead Time: 30 minutes Over limit: once a month	Lead Time: 1 minutes Over limit: 0	More efficient and effective
Shipping	FCL: no calculation and no record	FCL: 80% of overall shipment	More effective and efficient
Custom Clearance	Lead time: 6hours to 7 days	Lead time: <2 hours	More efficient
Customer Services	Complain Rate: 50-70%	Complain Rate: 10-20%	More effective

3.2.Research Question 2

To answer this question some interviews with employees from the RPI who take on the field logistic activities have been conducted. The purpose of these interviews is to gain some insight from employees', as the front line of company, point of view about the new IT system investment.

Effect on Employee

- **Order Processing**

Some effect on working performance for this job activities after IT system installed are: Less time inputting the order information to database; as mentioned in

findings on research question 1, lead time is reduced from 15-30 minutes to 3-5 minutes. Less job from the front desk makes the front desk less busy; this is shown by the company could cut down the staff needed for the job from 3 staffs down to 1 staff. Increase the effectiveness by diminishing the handwriting for paperwork which means reduce the human error. According to database an error rate was 3 out of 58 deliveries (RPI Surabaya Branch delivery on April, 2011). With new system the error rate is reduced down to 0 (since IT implemented).

A setback here, the system sometimes can't read for fail delivery or delay delivery. According to Mr. Anang Riswanto, the employees need always to input the reason for the system to understand if certain packages are canceled, fail, etc.

- **Information Flow**

For information flow there's no need a standby employee to handle the flow of information. However there's one big flaw here. According to Mrs. Diana Mai Rahayu because of all information travel online, the security and stable connection of system are crucial for the company to keep operate. An example for this is the event on 11 June 2013, whereas there's a system down from morning until 11.30. ; When the system down all employees lost control of package information which is a huge problem if the customer complain and ask for their package's condition.

- **Packaging**

There's no such big change for employee performance in packaging process.

- **Material Handling**

The scan system cause the field handler employees less effort in find out the status of certain package, as shown before that the handler now only need 1 minutes to gain the information.

- **Inventory Management**

There's energy save improvement as according to field employee, one employee could single handedly run the forklift as well as store it into the right storage rack; before the system implemented, it was needed at least 3 people to do the job separately. Currently in total every employee could sort package more than 100 packages daily (document packages observation from Surabaya RPI branch).

- **Shipping**

The effect that could be concluded is reduced time planning for container loading (the FCL findings in research question 1) and reduces the cost from less container load.

Mr. Tulus Priyanto said that the system needs to be more applicable and integrated because sometimes miss calculation occurs, causing FCL to be impossible. This happen mostly from packages that have unique shape (such as art work). Another setback here is the system is still can't integrated with the third party such as the expedition (ship) or cargo (airplane) company. This is sometimes resulting to the time delivery generated by the system become unreal, because of plan or ship delay which is not FedEx or RPI fault.

- **Custom Clearance**

The benefits for custom clearance employee from this system are there are clear digital connections from officer, employee, and customer; which will save time (as mentioned in research findings 1) from connecting these 3 parties.

- **Customer Service**

According to Mrs. Sasha Harnisawati and Mrs. Diana (Senior Customer Service of RPI Surabaya) with just input the code, she could gain access of packages status and deliver the information to customer, thus saving time in searching for the information. With clear information of certain packages, the company gets less complain from customer because the customer services always able to tell the customer whatever information they asked.

However the interview with Mr. Adi Patma Nusantara, Account Manager and Marketing of RPI Surabaya, give information that some trace and tracking system not 100% real time with the one owned by FedEx. For instance, in FedEx tracker its say that the package at Surabaya, but in RPI tracker it's actually still in custom at Jakarta. This problem sometimes makes customer a little bit confuse

3.3.Research Question 3

A discussion with head branch manager of RPI Surabaya, Mr Eri Sucahyo had been conducted to gain more insight in the planning section. After the discussion, 4 plans are presented in this section

Processing & Handling Plan

The first benefit for this plan is an integrated information data travel for all logistic activities. With this new plan, the lead time from manual searching for specific document could be reduced. The integrated system plan also allows the reverse information movement for clearance process or other logistic activities. Second benefit here is more effectiveness of data reading, by only scanning the system automatically read the data which result in less human error on it. Third benefit is less cost from printing huge amount of documents. And fourth better communication set up between divisions. To gain information from other divisions there's no need to phone call for specific persons from other division; instead the staff only needs to access the online system to obtain it.

Storing Plan

After integrating the information from other divisions, the current storing plan could make a great schedule for the movement of packages. This information gives the management the power to control of transit packages and inventory level as well as better forecast for future inventory.

Loading Plan

With the automation loading plan calculation, the management save time and cost for calculating the full container load for most of deliveries. With higher amount ratio of FCL (up to 80%) against LCL, RPI save more cost from every delivery.

Routing and Delivering Plan

After the new IT installment, the GPS system will calculate which one is the best route plan order for each ground delivery. The staff only needs to calculate all destinations of certain trucks deliveries and then the GPS system will generate the shortest destination route order for saving time and cost for gasoline.

The exact hour delivery generate by the new system also give more accurate time profile for consignee to be ready receiving the incoming packages. They also

could choose which time and day is best for them to receive the package, which gives better input to the system to plan when the packages should be delivered. Since last year (after system implemented) the rate of fail deliveries have been decreasing into 5-10%.

To sum up, the researcher found out that there're some change occurred in the planning, which are:

Table 2: Research finding 2 - Plan (Researcher)

Planning Type	Waste Before IT implementation	Change in new planning
Processing & Handling Plan	Long data travel lead time and no well communication device.	Integrated information data travel, scanning data reading, eliminating most paper form document, and set up better communication devices between divisions
Storing Plan	Uncertainty Package movement and schedule	calculate better schedule package movement for better package control
Loading Plan	higher shipping cost because of LCL	Have calculation for FCL, increasing its frequency against LCL delivery. Up to 80% of every shipment are FCL
Routing and delivering plan	Inefficient route delivery and up to 40% of fail delivery.	GPS system installed for better routing; and calculate exact hour of the incoming package then informing to consignee in order to prevent fail delivery.

3.4. Research Question 4

The researcher focuses on 3 chosen stakeholders which are the customer, shareholder and environment. Some reactions will be explained on those 3 stakeholders comparing before and after the IT system implementation. Afterward a performance measurement analysis on RPI will be conducted in order to find it out what are the specific drives in the IT implementation that cause these reactions as well as mapping the RPI IT investments.

- **Customer**

According to Mrs. Sasha Harnisawati and Mrs Diana Mai Rahayu, as the senior customer services of RPI Surabaya branch, the satisfaction level of customer increases drastically up to 45% from last year before the implementation (counted from company record of complain rate). The data are gathered from 15 loyal customers who frequently ask for deliveries.

- **Shareholder**

For shareholder, the researcher could not get any information on the financial growth in the company as it's case sensitive. However there's one thing that could be added here, there's an improvement in most employees salary up and dividend of shareholder to more than 50% since the last year before the IT system implementation. From the statement there's one thing that the researcher could concluded, there's an improvement in company's profits since they could afford the employee's salaries increase up to 50%.

- **Environment**

Three example findings proof to be could reduce the pollution. The first example here is the FCL plan system, with full container load, the vehicle could bring more packages in one go rather than do twice deliveries with less container load. In other word less travel cause less gas consumption which result to less pollution. Second example is the routing plan, with shorter and efficient travel route for truck; the company saves more gasoline from traveling the longer route, which means less pollution to air. And the last example is from the exact delivery hour plan. Every time fail deliveries occur, the truck is wasting the gasoline consumed which cause air pollution. However no clear data to support these statements, further research is advised for this area.

Performance Measurement analysis

To find out the drives from new investment to the stakeholder reaction and the status IT investment, a whole performance measurement analysis to the company after new IT system installment is conducted. But before that some metric should be chosen to decide which measure will be analyzed.

Table 3: KPI Metric List Used (Researcher)

Operational	Customer Service	Financial	Innovation
Package Accuracy	Detail Time Delivery	Dividend	Planning Accuracy
Document Accuracy	Overall Reliability	ROI	Software
Information Speed	Overall Satisfaction	Operational Cost	Hardware Utilization

After choosing these metrics, the researcher fills each metrics with the findings presented so far as well as based on interview with RPI employees on how they see the company from their perspective. Each metrics were given score 1-5 in which 1 for less improvement and 5 for most improvement. In the end it produces 2 performance measurement table analyses that comparing the previous performance and current performance.
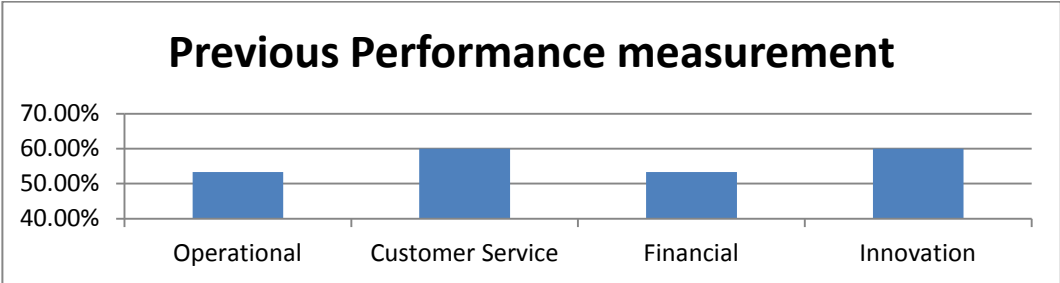

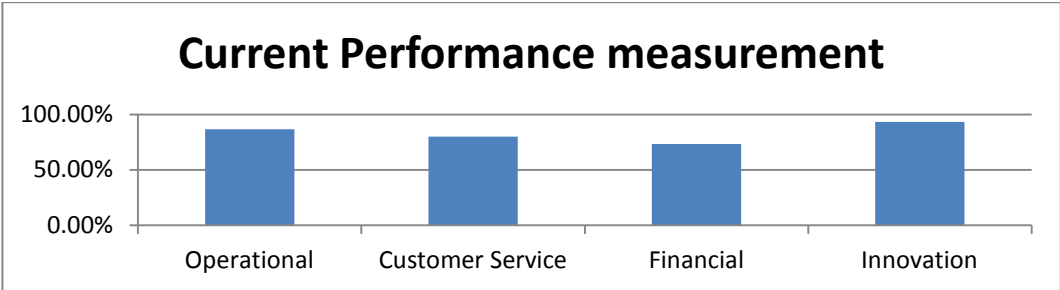Figure 3: Previous Performance Measurement (Interview and Data)

Figure 4: Current Performance Measurement (Interview and Data)

From these two performance measurement comparison there could be seen there are some improvement on the current performance. The operational performance improved up to 33.34%, the customer services performance is improved 20%, the financial performance is improved by 20% as well, and last the Innovation performance is improved by 33.34%. From these performance measurements analysis, the researcher could concluded an overall improvement performance in the form of a balanced scorecard as follows:
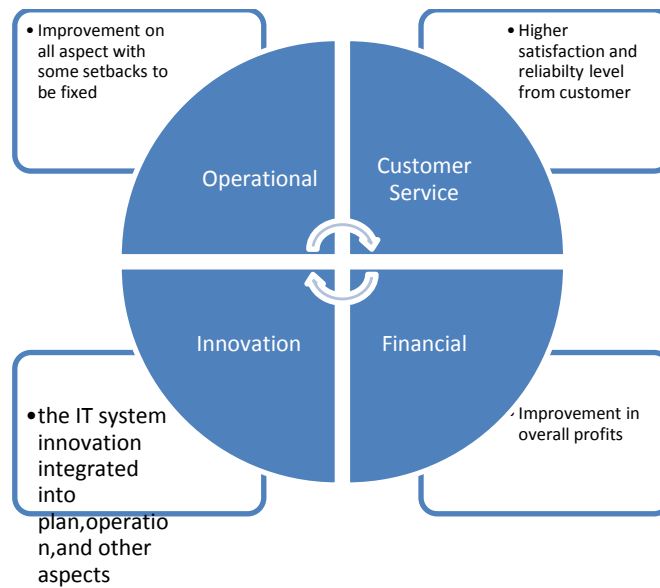
Figure 5: Balanced Scorecard (Researcher)

From the figure, it's shown that there are improvements on all aspect. In this analysis it's measured that the company achieve more than they expected in the first year of investment.

4. Conclusion

After comparing the findings so far and the IT investment goals as well as the company's vision and mission, in 1 year progress so far the IT investment could be said to be quite successful. Seeing from the company's investment goals, RPI already achieve the short and midterm goal which are:

- For short term, the company expects that at least all employees familiar with the new system and knows how to operate it in order to improve overall logistic capabilities

- For midterm, the company expect that most customer also aware about the new IT system and make a good use of it

However the company still needs a way to go to achieve the third investment goal, which is:

- For long term, the company expects that other parties (such as custom duty) also integrated with the system allowing future automation, scheduling, arrangement for shipment and faster & effective delivery.

As for overall conclusion, after the IT system implementation, there're indeed some clear findings of effectiveness and efficiency improvements in RPI, specify in its logistics activities. However, despite all of these positive findings, there are some drawbacks that need to be concerned.

5. Recommendations

Automation system

An automation self read IT system need to be implemented. This system is actually exist and already used by FedEx international, however the company still not fully integrate this software to its license holder.

Backup system

A backup system is needed to support the main connectivity line. The backup system usually named as disaster rescue system (DRC system). The DRC system will act to support in case the main line got problem. A DRC system should have be enables to continue processing data within 2 (two) hours from the time of a breakdown of the primary system. In case for big disaster (e.g. fire, flood, earthquake) the DRC system must keep duplicates of electronic data regarding packages deliveries in a separate place that is secure and not closer that 30 (thirty) kilometers from the principal location.

IT system quality

Need to improve the system calculation method for FCL. Again similar to first drawback this system actually already works for FedEx. Their IT already calculates for FCL maximization. To solve this problem, the management should ask FedEx for sharing IT system as the license owner for Indonesian FedEx market.

Total supply chain IT approach

The holistic IT implementation, not only to RPI and RPX group but also all parties who have an influence and connection in the whole supply chain system is needed to improve the information accuracy. With the implementation of total supply chain IT approach the total lead time deliveries could be generated more accurate by the IT system. However, this plan will be a long term investment plan along with high cost, so a further in depth research is needed to apply this long term plan.

Real Time Improvement

The solution to fix these mismatch information is by improving the real time integration between FedEx system and RPI system. Actually this improvement of real time integration is part of 5 years IT investment, so in following years the company will improve the real time differences in these two systems. Some future research to evaluate the improvement of this real time integration should be conducted later.

Gap Analysis Framework

The best investment implementation is a constant control and evaluates the investment while keep measure the gap between the current progress and the investment goals.

Table 4: Gap Analysis of RPI investment (Researcher)

- Gap 1: Logistic

Current Progress	Goals	Gap
- Improvement on all software based system - Moderate gain on technical hardware	- Strong infrastructure and software system base to support logistics activity	- Need to define what is the flaw of the system improvement

- Gap 2: People

Current Progress	Goals	Gap
- Improvement in motivation, flexibility, and working performance	- Expect to have flexibility and easier work activities to motivate the employee	- The goal is achieved, need to define next step to continue improving

- Gap 3: Plan

Current Progress	Goals	Gap
- Some improvement in eliminating wastes - Still lack of automation and can't plan for certain condition	- Information for better plan of packages control and movement - An automation system to help daily delivery planning	- An improvement in overall IT approach is needed. A recommendation proposed might help the company

- Gap 4: Stakeholder

Current Progress	Goals	Gap
- Customer: increase in satisfaction level - Stakeholder: improvement in value by up to 50% - Environment: minor contribution achieved, bigger contribution still in planning as current Indonesian society do not put much attention on it yet	- Customer: improve in satisfaction level - Stakeholder: increase their value - Environment: contribution for pollution reduction	- For customer and stakeholder, next milestone is needed for constant improvement - Further contribution needed

18

The gap analysis helps the company to focus and determine what their lack of in specific areas of operation. The researcher suggests that the company keep conduct the gap analysis and other analysis (such as balance scorecard and performance measurement) for certain period in order to find out their current condition and position.

Recommendations for future research

- **Data**

A lot of access to certain areas is prohibited to public, this setbacks resulting in not optimal research findings and recommendation. Some areas that researcher find to be important for improving this research is access to custom clearance, the financial database, IT system investment proposal (along with its payback period or ROI), and internal IT system quality control. With these data, the future research would have better direction in positioning and assessing the company's condition.

- **Time**

A longer time limit is needed. The investment itself took 5 years to finish, the research should conduct periodically basically once a year or two year. With longer time limit the researcher could have more time to do an in depth research observation as well interviewee more key players in the company.

- **Budget**

Some budget is needed to be allocated for future research. Some well sophisticated analysis software could help the future research in producing better analysis result, however these sophisticated software analysis aren't free. In conducting this thesis assignment, the researcher didn't have an access to these software.

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